

Listing of Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Claim 1. (original) An image decoding apparatus in which, for nonnegative integers i and j , data of an i -th key frame and a j -th key frame are defined as KF_i and KF_j , respectively, a correspondence data file between the i -th key frame and the j -th key frame is defined as $C_{i,j}$, and data of an intermediate frame between the i -th key frame and the j -th key frame is defined as $IF_{i,j}$, the apparatus comprising:

- an error detector which receives a data stream that includes KF_i , KF_{i+1} and $C_{i,i+1}$, and detects whether or not there is an error in the data stream;
- an intermediate image generator which generates $IF_{i,i+1}$ from the data stream;
- and
- an error controller which, when an error occurs in the data stream, controls said intermediate image generator in a manner such that an error avoidance processing is performed in said intermediate image generator.

Claim 2. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} , the error avoidance processing is performed by substituting data of another key frame for KF_{i+1} .

Claim 3. (original) An image decoding apparatus according to claim 2, wherein, the error avoidance processing is performed by substituting either KF_i or KF_{i+2} for KF_{i+1} .

Claim 4. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} , the error avoidance processing is performed in a manner such that $IF_{i,i+1}$ is generated based on data of another key frame and a correspondence data file relating thereto.

Claim 5. (original) An image decoding apparatus according to claim 4, wherein, the error avoidance processing is performed in a manner such that $IF_{i,i+1}$ is generated by deforming KF_i based on KF_i and $C_{i,i+1}$, without using KF_{i+1} .

Claim 6. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} and KF_{i+2} , the error avoidance processing is performed in a manner such that $IF_{i,i+1}$ is generated based on data of at least one key frame other than KF_{i+1} and KF_{i+2} , and at least two correspondence data files relating thereto.

Claim 7. (original) An image decoding apparatus according to claim 6, wherein, the error avoidance processing is performed in a manner such that $IF_{i,i+2}$ is generated by deforming KF_i based on $C_{i,i+1}$ and $C_{i+1,i+2}$, without using KF_{i+1} and KF_{i+2} .

Claim 8. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} , the error avoidance processing is performed in a manner such that a correspondence data file $C_{a,b}$, $a \leq i+1$ and $i+2 < b$, included in the data stream is detected, $IF_{a,b}$ is generated by utilizing $C_{a,b}$, KF_a and KF_b and then part of the generated $IF_{a,b}$ is substituted for $IF_{i+1,i+2}$.

Claim 9. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} , the error avoidance processing is performed in a manner such that a correspondence data file $C_{a,b}$, $a < i+1$ and $i+2 \leq b$, included in the data stream is detected, $IF_{a,b}$ is generated by utilizing $C_{a,b}$, KF_a and KF_b and then at least a part of the generated $IF_{a,b}$ is substituted for $IF_{i+1,i+2}$.

Claim 10. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in KF_{i+1} , the avoidance processing is performed in a manner such that a correspondence data file $C_{a,b}$, $a \ll i+1$ and $i+2 \ll b$, included in the data stream is detected, $IF_{a,b}$ is generated by utilizing $C_{a,b}$, KF_a and KF_b and then part of the generated $IF_{a,b}$ is substituted for $IF_{i+1,i+2}$.

Claim 11. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in $C_{i+1,i+2}$, the error avoidance processing is performed in a manner such that another correspondence data file is substituted for $C_{i+1,i+2}$.

Claim 12. (original) An image decoding apparatus according to claim 11, wherein the error avoidance processing is performed in a manner such that either $C_{i,i+1}$ or $C_{i+2,i+3}$ is substituted for $C_{i+1,i+2}$.

Claim 13. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in $C_{i+1,i+2}$, the error avoidance processing is performed in a manner such that a new correspondence data file generated based on at least two other correspondence data files is substituted for $C_{i+1,i+2}$.

Claim 14. (original) An image decoding apparatus according to claim 13, wherein, the error avoidance processing is performed in a manner such that a new correspondence data file generated based on both $C_{i,i+1}$ and $C_{i+2,i+3}$ is substituted for $C_{i+1,i+2}$.

Claim 15. (original) An image decoding apparatus according to claim 1, wherein, when the error occurs in $C_{i+1,i+2}$, the error avoidance processing is performed in a manner such that $C_{i+1,i+2}$ is adjusted to specify an identity mapping.

Claim 16. (original) An image decoding apparatus according to claim 1, wherein, said error controller abandons the error avoidance processing in the event that it is judged that seriousness of the error is below a predetermined level.

Claim 17. (original) An image decoding apparatus according to claim 1, wherein the correspondence data file $C_{i,j}$ is generated based on a pixel-based matching computation between KF_i and KF_j and said intermediate image generator generates an intermediate frame $IF_{i,j}$ by interpolation based on KF_i , KF_j and $C_{i,j}$.

Claim 18. (original) An image coding apparatus in which, for nonnegative integers i and j , data of an i -th key frame and a j -th key frame are defined as KF_i and KF_j , respectively, and a correspondence data file between the i -th key frame and the j -th key frame is defined as $C_{i,j}$, the apparatus comprising:

- an image input unit which receives data for key frames;

- a correspondence data generator which generates $C_{i,i+1}$ by utilizing KF_i and KF_{i+1} , and generates $C_{i,j}$ by utilizing KF_i and KF_j , $j > i+1$, among the input key frame data; and

- a stream generator which generates a data stream including data generated by said correspondence data generator.

Claim 19. (original) An image coding apparatus according to claim 18, wherein said correspondence data generator generates $C_{i,j}$ in a manner such that intensity of $C_{i,j}$ is lower than that of the $C_{i,i+1}$.

Claim 20. (original) An image coding apparatus according to claim 18, wherein said correspondence data generator generates $C_{i,i+1}$ and $C_{i,j}$ in a manner such that data used for checking for errors are embedded in the $C_{i,i+1}$ and $C_{i,j}$.

Claim 21. (original) An image coding apparatus according to claim 18, wherein said correspondence data generator generates correspondence data files by computing a matching between critical points detected through a two-dimensional search respectively conducted on two key frames.

Claim 22. (original) An image coding apparatus according to claim 18, wherein a portion of a frame is divided into a plurality of block regions to each of which a parity bit is added, and error is detected in only said portion which is considered to be of high importance.

Claim 23. (original) An image coding apparatus according to claim 18, wherein a portion of $C_{i,j}$ is divided into a plurality of data blocks and each of the data blocks is provided with a parity bit.

Claims 24-26. (cancelled)

Claim 27. (currently amended) An image decoding method ~~according to claim 24,~~
~~wherein,~~ comprising:

acquiring a data stream that includes a plurality of key frames and a correspondence data file therebetween;

generating an intermediate frame between the key frames, from the data stream;

and

monitoring for an error in the data stream,

wherein, when an error is detected, an error avoidance processing is performed

at the time of said generating the intermediate frame, and when the error is

detected in a correspondence data file, the error avoidance processing is performed in a manner such that the intermediate frame is generated from another correspondence data file which is substituted for the error-containing correspondence data file.

Claim 28. (currently amended) An image decoding method ~~according to claim 24,~~
~~wherein,~~ comprising:

acquiring a data stream that includes a plurality of key frames and a correspondence data file therebetween;

generating an intermediate frame between the key frames, from the data stream;

and

monitoring for an error in the data stream,

wherein, when an error is detected, an error avoidance processing is performed

at the time of said generating the intermediate frame, and when the error is

detected in a correspondence data file, the error avoidance processing is

Appl. No.: 10/092,205
Amdt. dated: June 7, 2005
Reply to Office Action of March 8, 2005

performed in a manner such that the intermediate frame is generated based on a new correspondence data file generated based on another correspondence data file.

Claims 29 - 33. (cancelled)